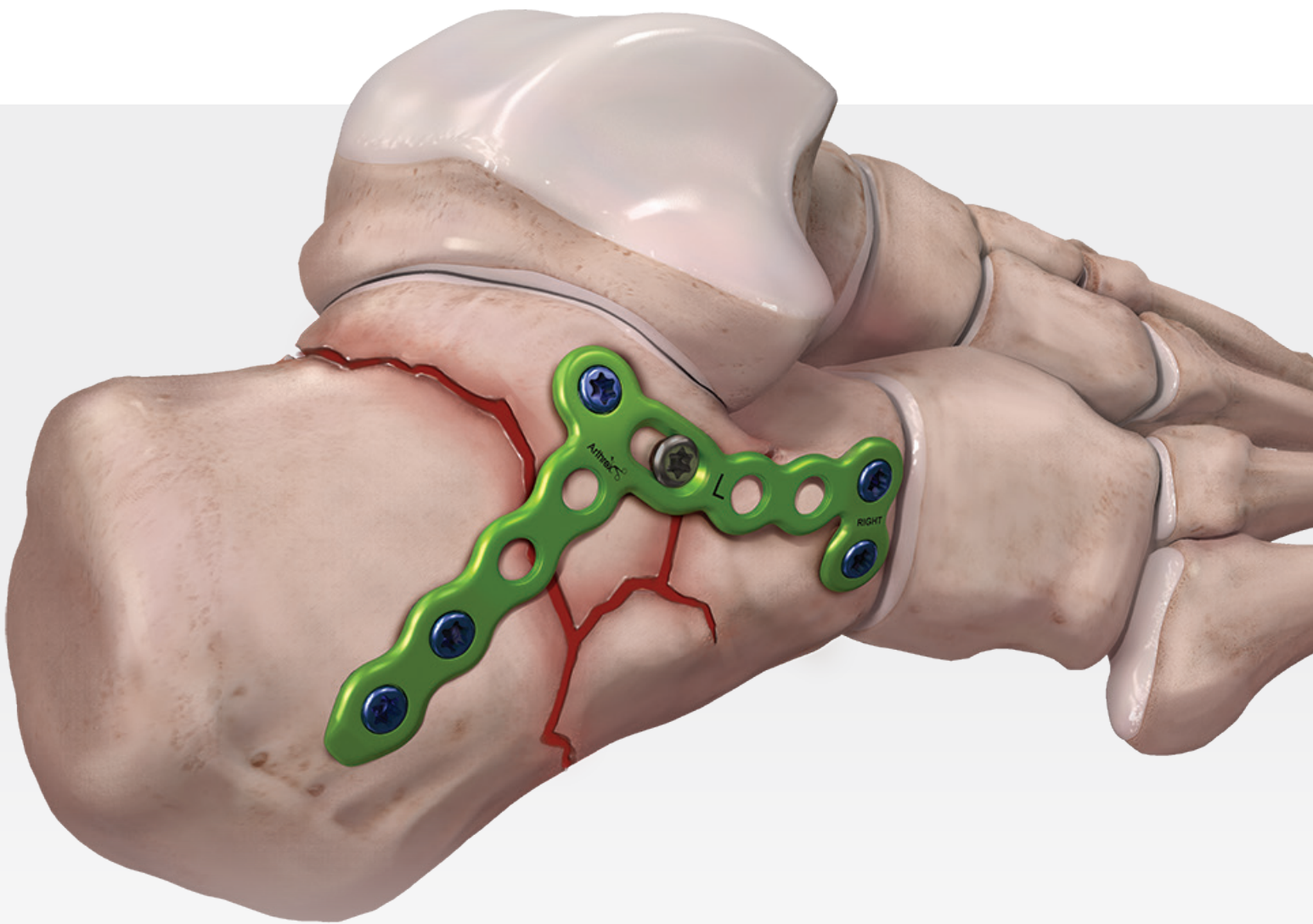


# Calcaneal Fracture System

Surgical Technique



# Arthrex Calcaneal Fracture System

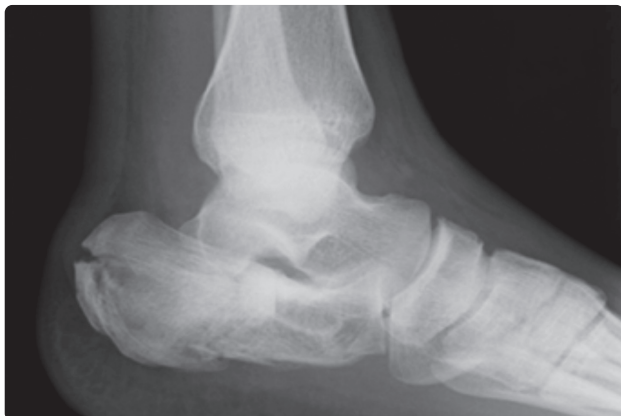
The calcaneal fracture system includes all plates, screws, and instrumentation needed to treat calcaneal fractures with 17 different low-profile titanium plates with locking and nonlocking options. The percutaneous plates include guides to facilitate the sinus tarsi approach if used.

## Applications

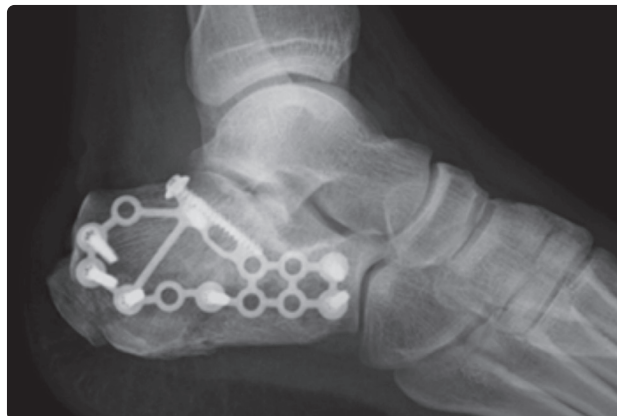
- › Extra- and intra-articular calcaneal fractures
- › Tongue-type calcaneal fractures
- › Joint depression calcaneal fractures
- › Comminuted calcaneal fractures

## Features

- › **Plates**—four different sizes (XS, S, M, L) of left and right perimeter plates and five different percutaneous plates, also in left and right, designed to fit the anatomy and contour of the calcaneus and address all calcaneal fracture patterns
- › **Low profile**—strong 1.35 mm-thick locking perimeter and percutaneous plates for conformability and less soft-tissue irritation
- › **Calcaneal-specific instrumentation**—plate cutter, Schanz pins, keyless chuck T-handle, and calcaneal-specific elevators all within the set
- › **Variable-angle locking**—up to 15° with 3.5 mm screws
- › **Multiple screw options**—3.5 mm cortical, 3.5 mm variable-angle locking (VAL), 4.0 mm cancellous, and 4.0 mm cannulated screws



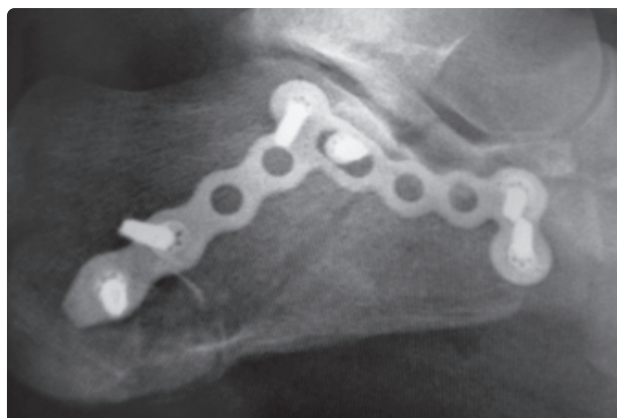
Preoperative



Postoperative

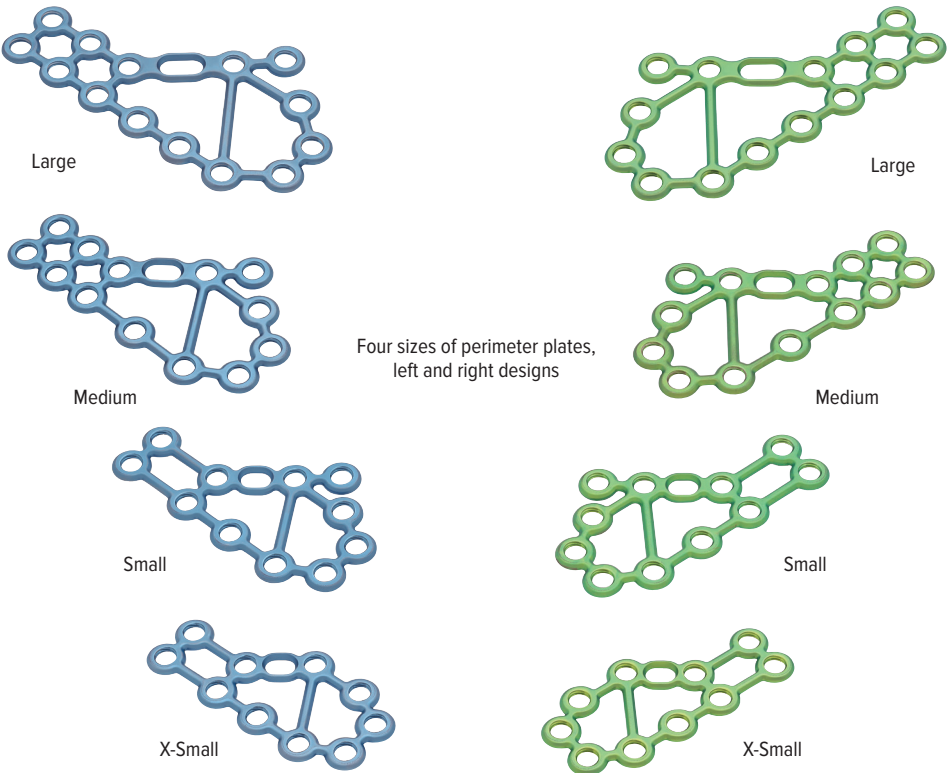
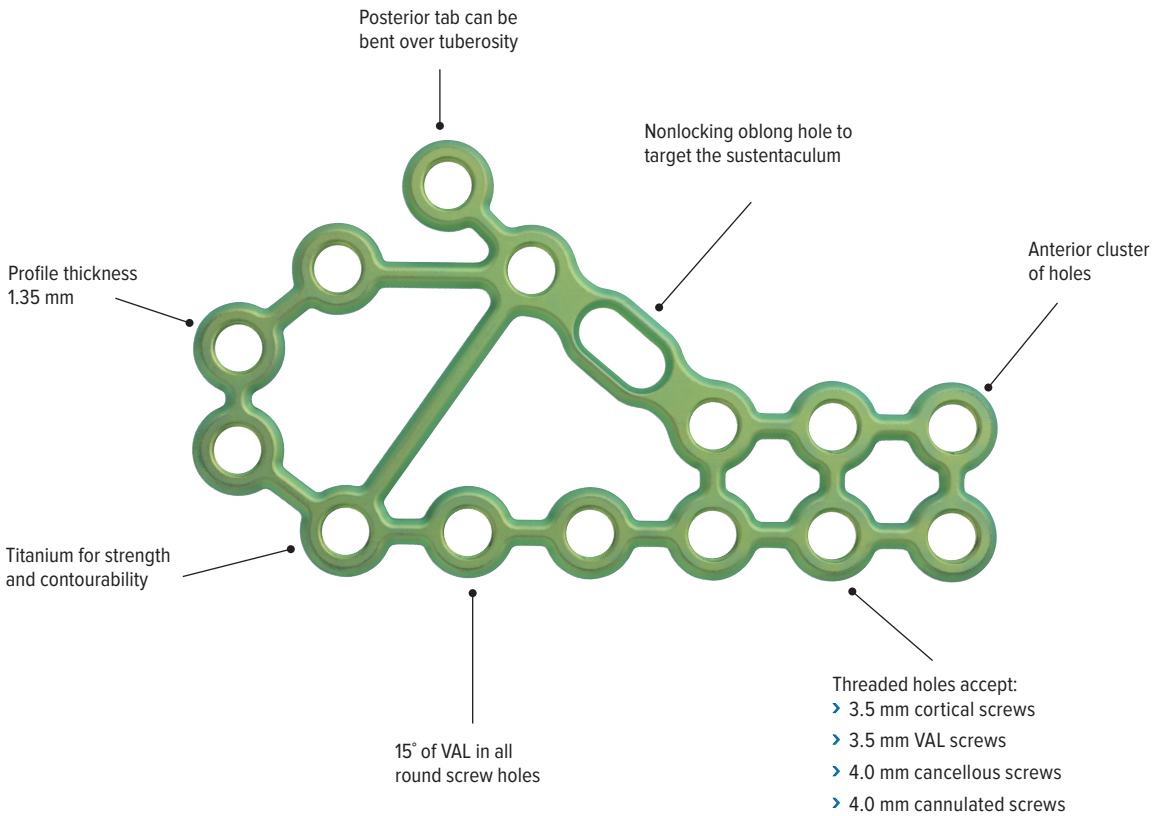


Preoperative

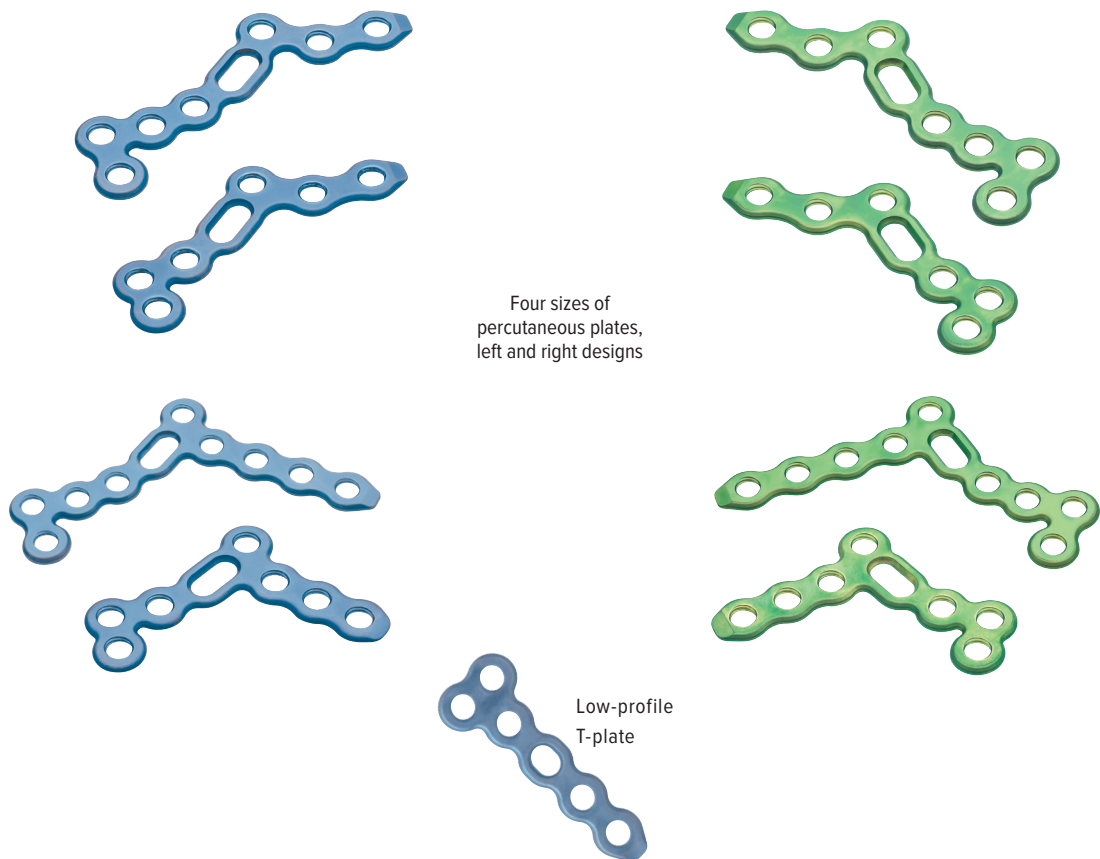
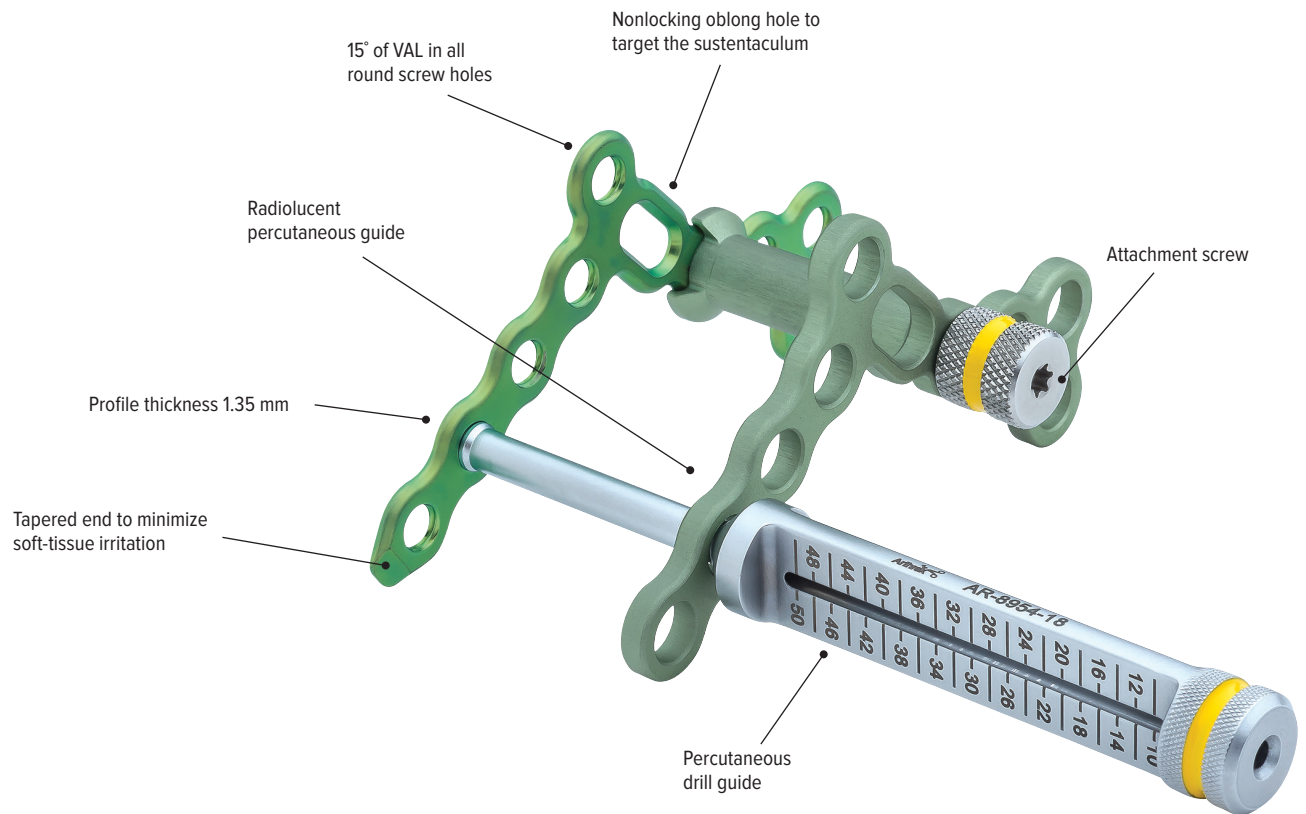


Postoperative

# Calcaneal Fracture Perimeter Plates

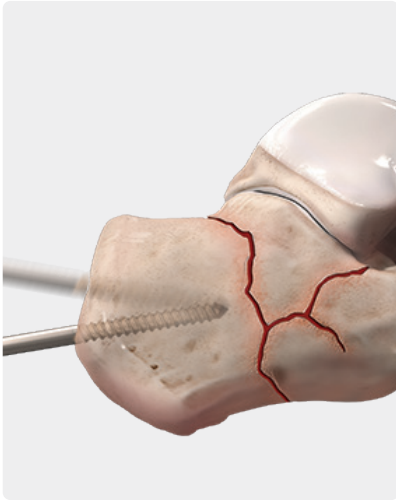


# Calcaneal Fracture Percutaneous Plates





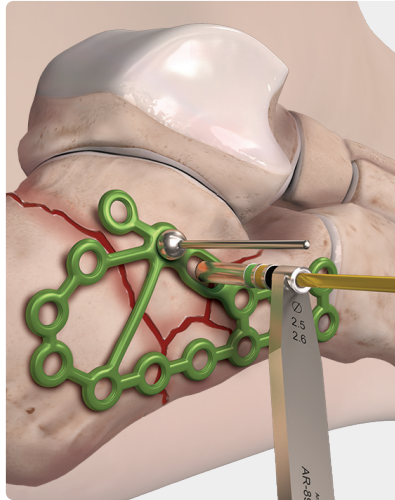
## Calcaneal Fracture Perimeter Plate Technique



1

### Fracture Reduction

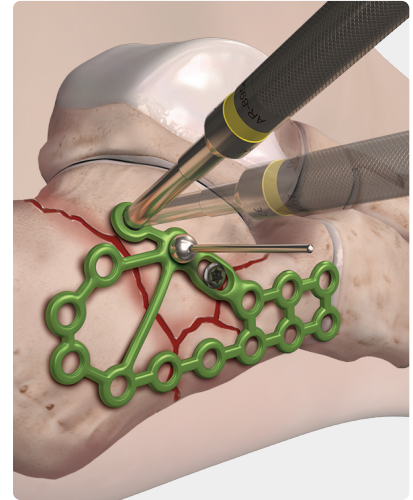
Calcaneal-specific instrumentation such as Sayre and key elevators may be used to reduce the fragments. A Schanz pin with an AO connection can be placed into the calcaneal tuberosity to provide traction and manipulate the tuberosity from its angulated and translated position.



2

### Plate Selection

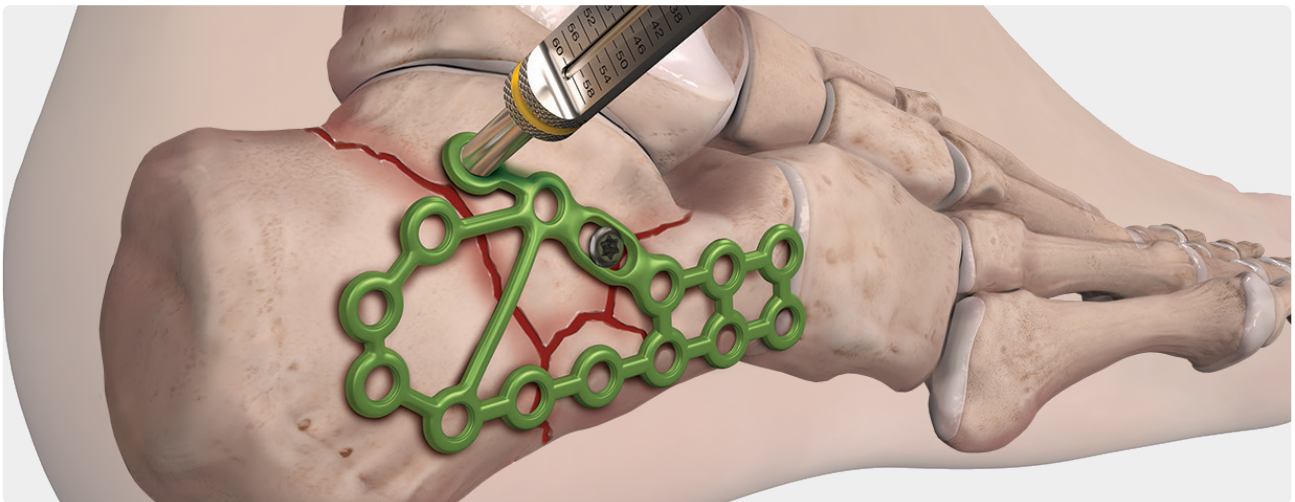
Select the appropriate calcaneal fracture perimeter plate to match the bony anatomy. Place the plate at the appropriate position on the lateral calcaneal wall with BB-Tak anchors or K-wires for temporary fixation.



3

### In Situ Contouring

If the plate needs to be contoured, thread the locking drill guides or the bending guides into a screw hole and use them as benders.



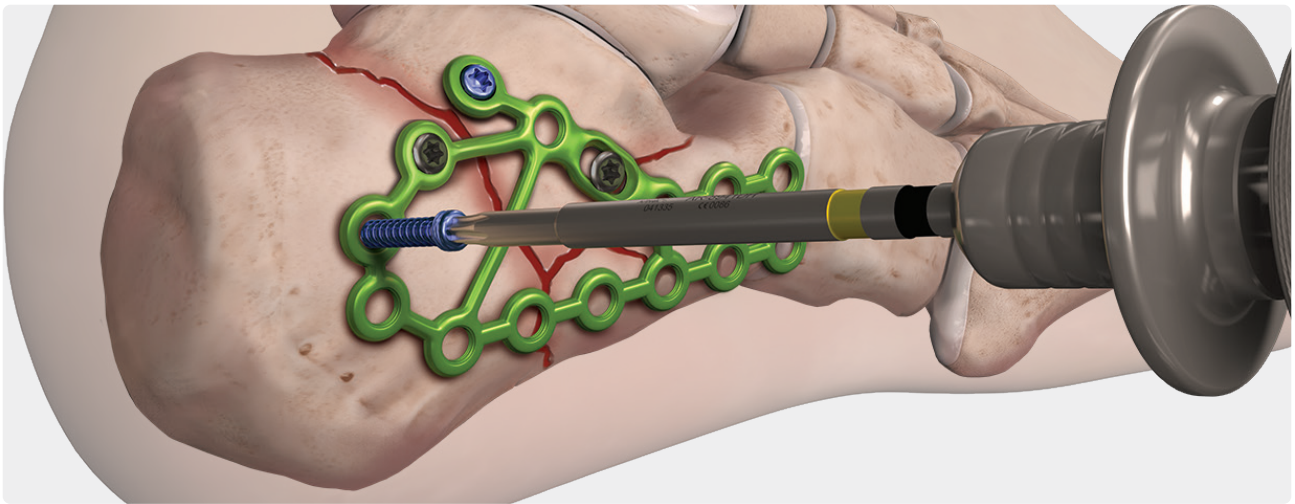
4

### Screw Insertion

Place a nonlocking or cannulated screw inferior to the articular surface of the posterior facet from lateral to medial to the sustentacular fragment or “constant fragment.” This screw can be placed outside the plate or through the oblong hole in the plate depending on surgeon preference.

### Nonlocking Screws

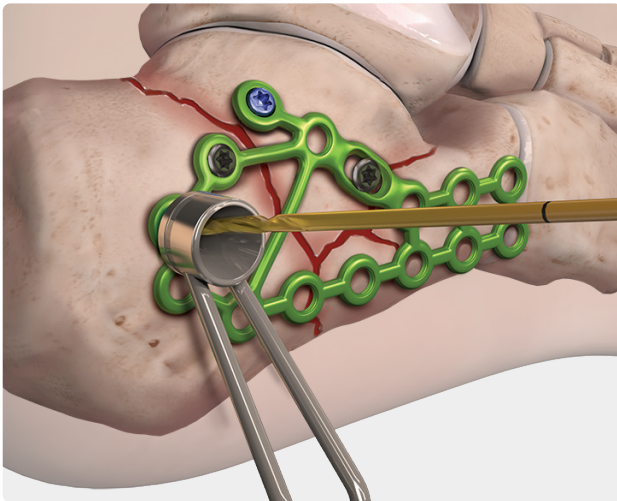
1. Nonlocking screws should be placed first to indirectly reduce the plate to the calcaneus.
2. Drill through the 2.5 mm drill guide with the 2.5 mm drill bit.
3. Measure for screw length using the screw depth device.
4. Insert the appropriate 3.5 mm or 4.0 mm screw with the T15 driver.



5a

#### VAL Screws With Fixed-Angle Guide

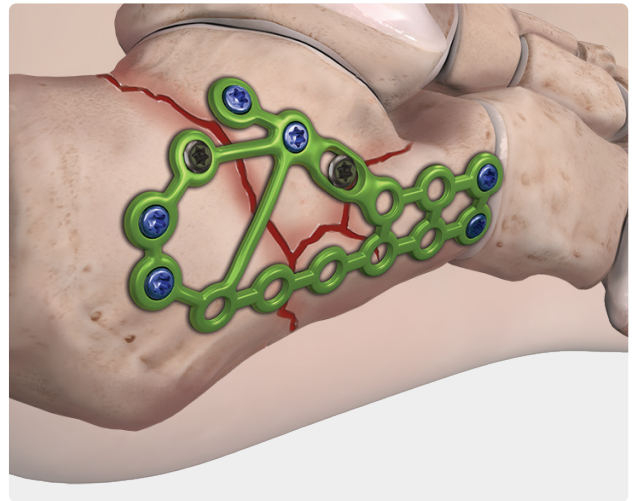
1. Thread the 3.5 mm threaded drill guide into the desired plate hole and drill using the 2.5 mm drill bit. The screw will be perpendicular to the plate.
2. Read the corresponding screw length from the laser line on the drill. Alternatively, the screw depth device can be used to determine the screw length.
3. Insert the appropriate 3.5 mm locking screw with the T15 driver.



5b

#### VAL Screws With VAL Guide

1. Place the 3.5 mm VAL guide into the appropriate plate hole and prepare a hole with the 2.5 mm drill bit. The VAL guide will allow up to 15°.
2. Measure for screw length using the screw depth device.
3. Insert the appropriate 3.5 mm locking screw.

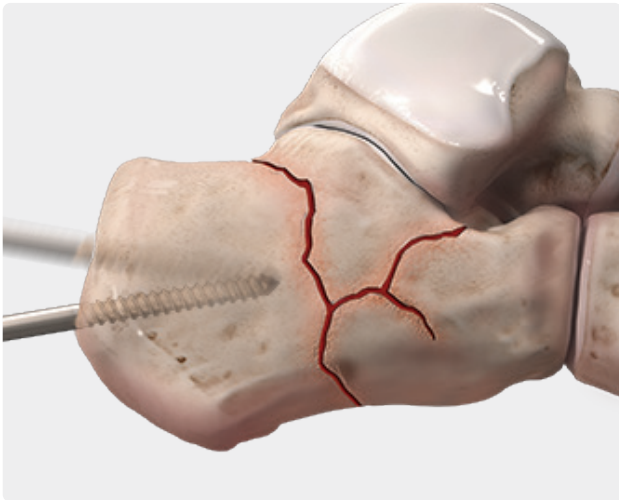


6

Verify plate and screw placement with fluoroscopy using lateral, A/P, and axial heel views.



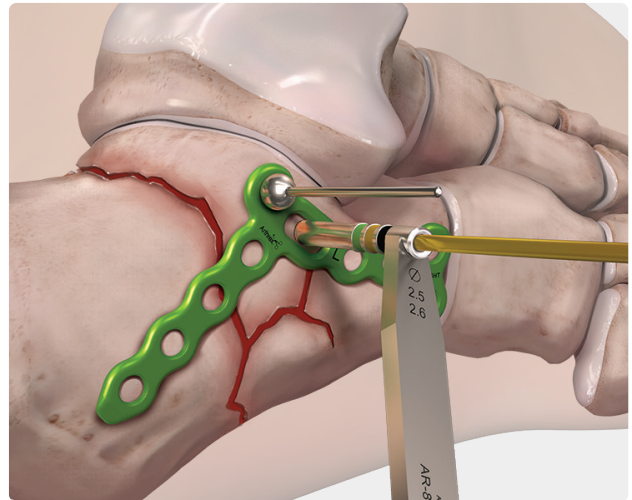
## Calcaneal Fracture Percutaneous Plate Technique



1

### Fracture Reduction

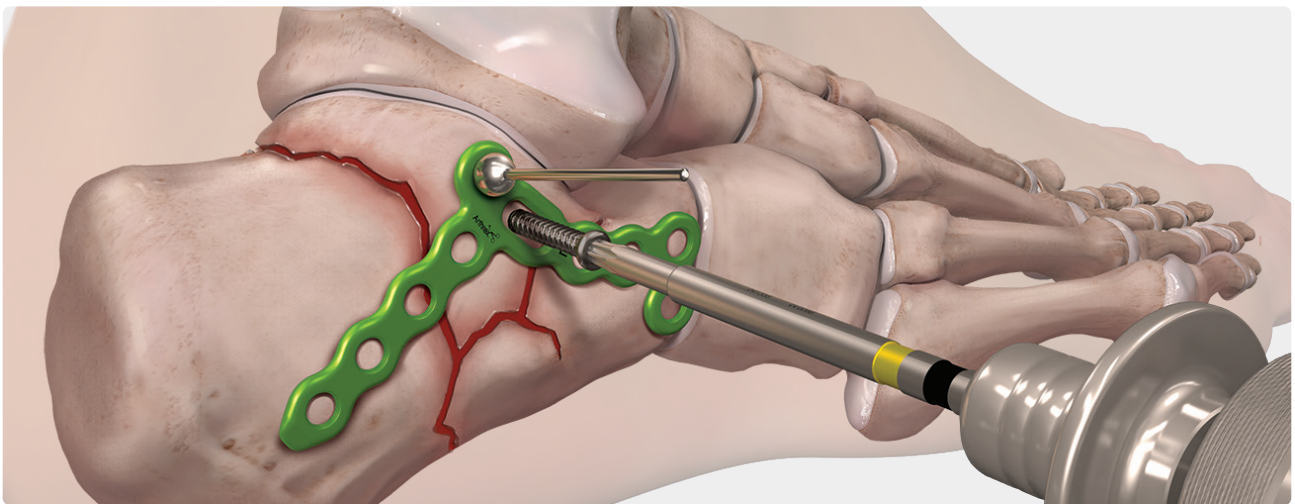
Calcaneal-specific instrumentation such as Sayre and key elevators may be used for the reduction. A Schanz pin with an AO connection can be placed into the calcaneal tuberosity to provide traction and manipulate the tuberosity from its angulated and translated position.



2

### Plate Selection

Select the appropriate calcaneal fracture percutaneous plate to match the bony anatomy. Place the plate at the appropriate position on the lateral calcaneal wall. Secure the plate with BB-Tak anchors or K-wires for temporary fixation.

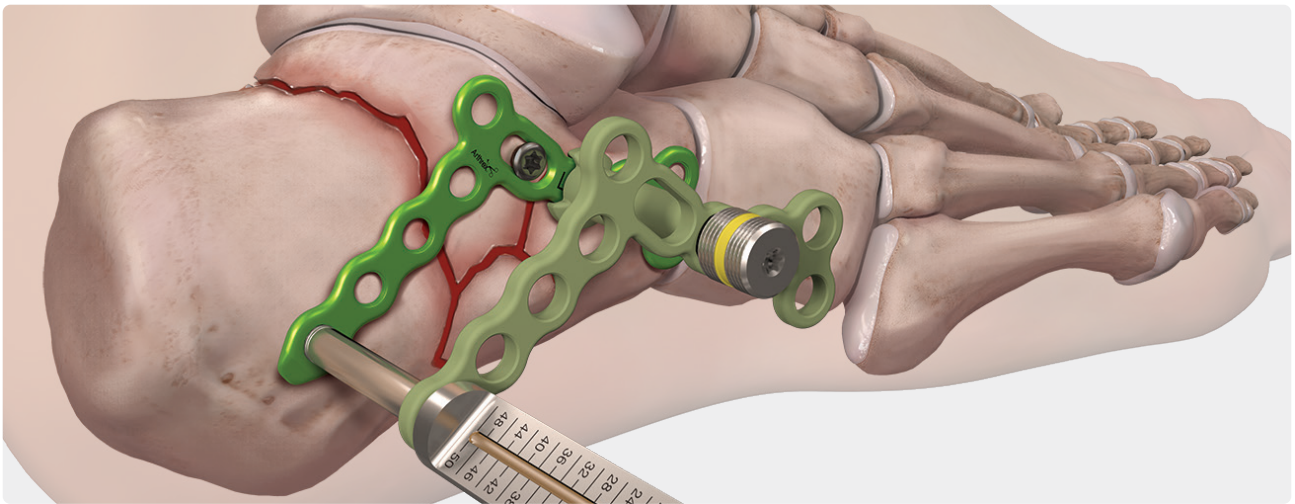


3

### Screw Insertion

A nonlocking or cannulated screw should be placed inferior to the articular surface of the posterior facet from lateral to medial to the sustentacular fragment or "constant fragment." This screw can be placed outside the plate or through the oblong hole in the plate depending on surgeon preference.

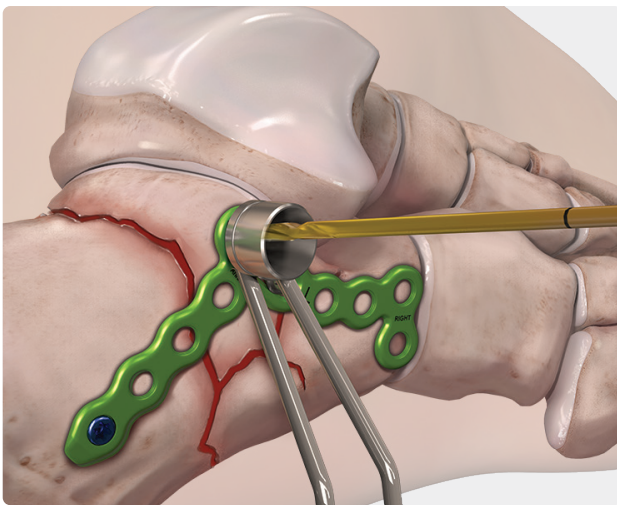
1. Nonlocking screws should be placed first to indirectly reduce the plate to the calcaneus.
2. Drill through the 2.5 mm drill guide with the long 2.5 mm drill bit.
3. Measure for screw length using the screw depth device.
4. Insert the appropriate 3.5 mm or 4.0 mm screw.



4

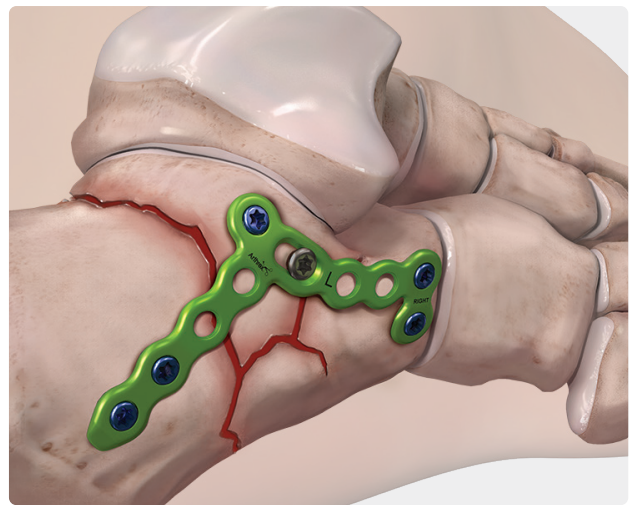
#### Locking Screws

1. Thread the 3.5 mm threaded drill guide into the desired plate hole and drill using the 2.5 mm-long drill bit.
2. Read the corresponding screw length from the laser line on the drill. Alternatively, the screw depth device can be used to determine the screw length.
3. Insert the 3.5 mm locking screw through the guide.



#### Variable-Angle Locking Screws

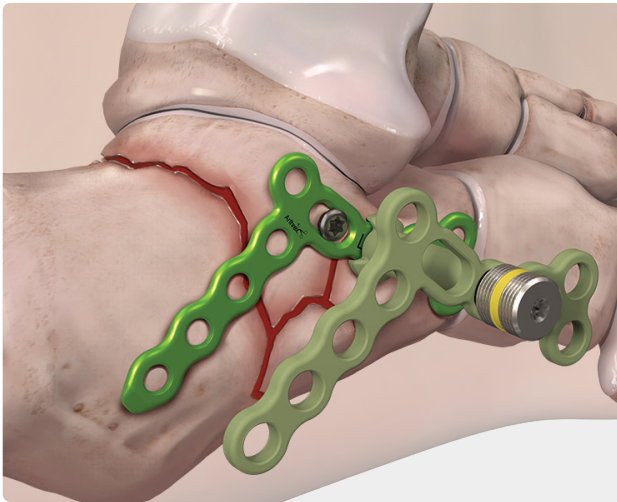
1. Thread the 3.5 mm VAL guide into the appropriate plate hole and drill with the 2.5 mm drill bit. The VAL guide will allow up to 15° angle.
2. Measure for screw length using the screw depth device.
3. Insert the appropriate 3.5 mm locking screw.



Verify plate and screw placement with fluoroscopy using lateral, A/P, and axial heel views.

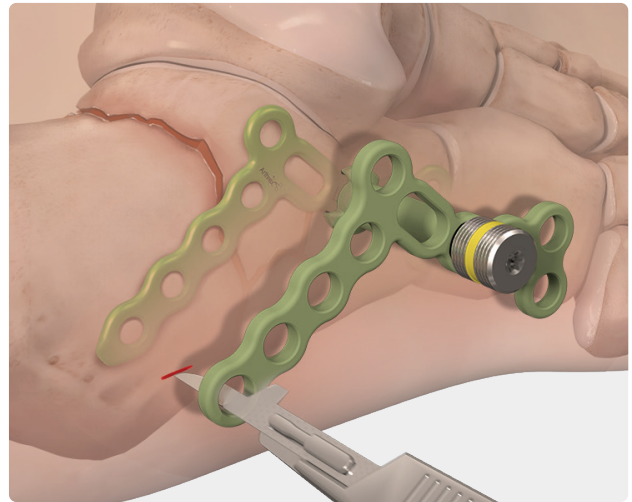


## Optional: Percutaneous Guides



### Percutaneous Guide

The percutaneous calcaneal guide provides a means for locating, drilling, measuring, and inserting screws. The percutaneous guide is connected to the corresponding plate through the attachment screw with a clockwise quarter-turn through the hole anterior to the oblong hole. The plate should be attached to the calcaneus with a 3.5 mm nonlocking screw, BB-Tak, or K-wire. Attach the locking percutaneous drill guide through the percutaneous calcaneal guide.



The skin can be marked for percutaneous insertion of screws.

# Biologic Augmentation Options



## QuickSet™ Calcium Phosphate Cement

Quickset cement is a macroporous, injectable, hardening, resorbable bone cement provided in an easy-to-use, closed mixing system with high compressive strength

QuickSet cement, 5 cc	ABS-3005
QuickSet cement, 8 cc	ABS-3008



## BoneSync™ Bone Void Fillers

BoneSync bone void fillers provide an osteoconductive scaffold and contain type 1 collagen allowing the grafts to be hydrated with biologic fluids such as bone marrow aspirate to optimize bone remodeling potential. This versatile matrix can bring volume or moldability to fracture cases while offering unique handling characteristics.

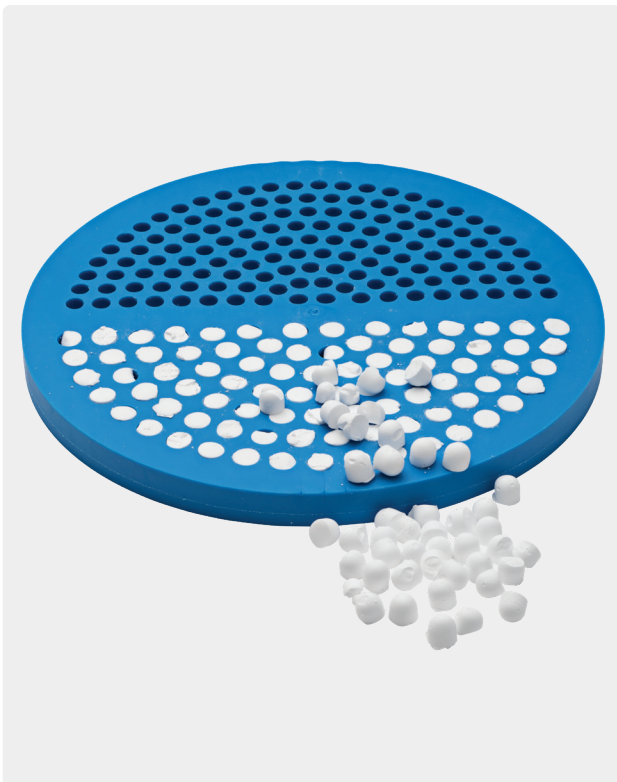
BoneSync cement, 3 cc	ABS-3103
BoneSync cement, 5 cc	ABS-3105
BoneSync putty, 2.5 cc	ABS-3202
BoneSync putty, 5 cc	ABS-3205
BoneSync putty, 10 cc	ABS-3210
BoneSync putty, 15 cc	ABS-3215



### AlloSync™ Pure Matrix

AlloSync Pure demineralized bone matrix is derived from 100% allograft bone. Surgeons can adjust the viscosity of AlloSync Pure bone matrix to have a more flowable or putty-like consistency based on hydration ratio to readily mold into various bone voids or fracture patterns.

AlloSync Pure, 1 cc	ABS-2010-01
AlloSync Pure, 2.5 cc	ABS-2010-02



### Arthrex Calcium Sulfate BioBeads

Arthrex Calcium Sulfate BioBeads can be used to fill in bony voids and be used at the site of bony infections, and can be delivered in a bead or paste configuration. Bead sizes available include 3 mm, 4.5 mm, or 6 mm, providing surgeons a versatile, biodegradable, and biocompatible bone void filler.

Arthrex Calcium Sulfate BioBeads, 5 cc	ABS-3000-05
Arthrex Calcium Sulfate BioBeads, 10 cc	ABS-3000-10
Arthrex Calcium Sulfate BioBeads, 20 cc	ABS-3000-20



## Ordering Information

### Calcaneal Fracture Set (AR-8950S-04)

Schanz Pin, self-drilling, 5 mm	AR-8954-01
Schanz Pin Handle (tri-flat keyless chuck)	AR-8954-02
Plate Cutter, Hercules style	AR-8954-03
Sayre Elevator	AR-8954-05
Key Elevator, ⅜ in wide	AR-8954-06
Drill Guide, VAL, 3.5 mm	AR-8935GV
Drill Guide, VAL, locking, 3.5 mm	AR-8935GVN
CFS Tray Insert, calcaneus instruments	AR-8950C-32

### Percutaneous Plate and Drill Guides (AR-8950S-05)

Guide, perc-calc ant process calcaneal plate, standard, left	AR-8954-08
Guide, perc-calc ant process calcaneal plate, standard, right	AR-8954-09
Guide, perc-calc ant process calcaneal plate, long, left	AR-8954-10
Guide, perc-calc ant process calcaneal plate, long, right	AR-8954-11
Guide, perc-calc anterior process/posterior tuberosity calcaneal plate, standard, left	AR-8954-12
Guide, perc-calc anterior process/posterior tuberosity calcaneal plate, standard, right	AR-8954-13
Guide, perc-calc anterior process/posterior tuberosity calcaneal plate, long, left	AR-8954-14
Guide, perc-calc anterior process/posterior tuberosity calcaneal plate, long, right	AR-8954-15
Attachment Screw, perc-calc guide	AR-8954-16
Joystick, perc-calc guide	AR-8954-17
Drill Guide, perc, threaded, locking, 3.5 mm	AR-8954-18
Depth Device, nonlocking	AR-8954-19
VAL Guide, 3.5 mm	AR-8935GV
VAL Guide, locking, 3.5 mm	AR-8935GVN
Plate Caddy, 3.5 mm	AR-8950C-33
Caddy, calc FX plates and instruments	AR-8950C-34

### Percutaneous Plates

Calcaneal Fracture Percutaneous Plate, anterior process/posterior tuberosity, standard, left	AR-8954YL-S
Calcaneal Fracture Percutaneous Plate, anterior process/posterior tuberosity, standard, right	AR-8954YR-S
Calcaneal Fracture Percutaneous Plate, anterior process/posterior tuberosity, long, left	AR-8954YL-L
Calcaneal Fracture Percutaneous Plate, anterior process/posterior tuberosity, long, right	AR-8954YR-L
Calcaneal Fracture Percutaneous Plate, anterior process, standard, left	AR-8954ML-S
Calcaneal Fracture Percutaneous Plate, anterior process, standard, right	AR-8954MR-S
Calcaneal Fracture Percutaneous Plate, anterior process, long, left	AR-8954ML-L
Calcaneal Fracture Percutaneous Plate, anterior process, long, right	AR-8954MR-L
Low Profile T-Plate, 3.5 mm, 4 hole	AR-8954MT

### Perimeter Plates

Calcaneal Fracture Perimeter Plate, x-small, left	AR-8954PL-XS
Calcaneal Fracture Perimeter Plate, small, left	AR-8954PL-S
Calcaneal Fracture Perimeter Plate, medium, left	AR-8954PL-M
Calcaneal Fracture Perimeter Plate, large, left	AR-8954PL-L
Calcaneal Fracture Perimeter Plate, x-small, right	AR-8954PR-XS
Calcaneal Fracture Perimeter Plate, small, right	AR-8954PR-S
Calcaneal Fracture Perimeter Plate, medium, right	AR-8954PR-M
Calcaneal Fracture Perimeter Plate, large, right	AR-8954PR-L

### Disposables

BB-Tak	AR-13226
BB-Tak, threaded	AR-13226T
Schanz Pin, 5 mm, self-drilling, 150 mm	AR-8954-01
Guidewire w/ Trocar Tip, 0.062 in (1.6 mm), qty. 3	AR-8941K
Guidewire w/ Trocar Tip, threaded, 0.062 in (1.6 mm), qty. 3	AR-8941KT
Guidewire w/ Trocar Tip, nonthreaded, 0.094 in (2.4 mm) × 8 in, qty. 4	AR-8967K

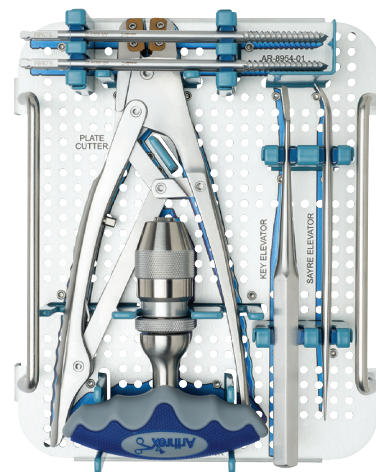
### 3.5 mm/4.0 mm Screws (AR-8950C-10)

Low Profile Cortical Locking Screw, Ti, 3.5 mm × 14 mm-60 mm, qty. 4	AR-8935L-14 – 60
Low Profile Cortical Screw, Ti, 3.5 mm × 14 mm-60 mm, qty. 4	AR-8935-14 – 60
Low Profile Cancellous Screw, Ti, 4 mm-60 mm, qty. 4	AR-8940-14 – 60
Low Profile Cancellous Screw, Ti, cannulated, short, threaded, 4 mm × 14 mm-60 mm, qty. 4	AR-8740-14PTS – 60PTS

## Calcaneal Fracture System



Calcaneal Fracture Plates and Instruments Module — AR-8905S-05



Calcaneal Fracture Instrument Set — AR-8950S-04

## Complementary Products

### Compression FT Screw System

- › 5.0 mm Large Compression FT Screws (20 mm-50 mm, 2 mm increments/55 mm-90 mm, 5 mm increments)
- › 7.0 mm X-Large Compression FT Screws (35 mm-120 mm, 5 mm increments/125 mm-140 mm, 5 mm increments, sterile only)

### Large Cannulated Screws

- › 4.5 mm Fully and Partially Threaded Cannulated Screws (20 mm-80 mm)
- › 6.7 mm Fully and Partially Threaded Cannulated Screws (40 mm-120 mm)

### Orthobiologics

- › BoneSync™ Calcium Phosphate Cement
- › Quickset™\* Calcium Phosphate Bone Cement
- › StimuBlast\*\*\* Demineralized Bone Matrix

### TRIM-IT Drill Pin®

- › Absorbable K-wires that can be used to stabilize the fractures without the need for removal

\*Quickset is a registered trademark of Graftys, S.A.

\*\*StimuBlast a registered trademark of AlloSource

## Notes



## Notes

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.



Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)



US patent information